



Akaroa

Wastewater Treatment Plant

Annual Monitoring Report

07/2014 – 06/2015

Prepared by: City Care Ltd
Kevin Willers

On behalf of:

Christchurch City Council, City Water & Waste Unit

25 August 2015

Resource Consent Number: CRC133179 (replaces CRC071865.1)
File Number: CO6C/01282
Client Name: Christchurch City Council (City Solutions)
To: To discharge contaminants into the Coastal Waters.
Consent Location: Red House Bay, Beach Road, AKAROA HARBOUR
State: Current

Events:

8/09/2013 Commencement Date
 8/09/2020 Consent Expires
 8/09/2020 Lapse Date if not Given Effect To

1	The discharge shall be only treated wastewater from the Akaroa Wastewater Treatment Plant (WWTP), located at Redhouse Bay, Akaroa Harbour at or about map reference (NZMG) NZMS 260: N37: 0569-0984; (NZTM) Topo 50: BY25:9568-4825, as shown on Plan CRC133179A, which forms part of this consent.
Compliance	
2	Treated wastewater from the Akaroa Wastewater Treatment Plant shall be discharged into Akaroa Harbour via an existing 100 metre long submerged outfall at or about map reference (NZMG) NZMS 260: N37: 0558-0991; (NZTM) Topo 50: BY25:9558-4831, as shown on Plan CRC133179A.
Compliance	
3	Warning notices, which can be read from a distance of five metres, shall be erected and maintained at the following locations: On the shoreline 400 metres either side of the point on the shoreline nearest the outfall, and Beside Beach Road adjacent to the rocks that lead out to Green Point. The warning notices shall advise the public of the existence of a wastewater outfall and the dangers of swimming in the area or eating shellfish collected in that location.
Compliance	
4	a. The volume of wastewater discharged from the Akaroa Wastewater Treatment Plant shall be continuously recorded using a flow meter. b. The readings from the flow meter shall be recorded in litres per second and shall be used to calculate the daily volume of wastewater discharged from the treatment plant. These daily volumes shall be recorded and used to determine compliance with Condition (5).
Compliance (Attachment 1)	
5	The volume of treated wastewater discharged shall not exceed 750 cubic metres per day, except during rainfall events of a total of 50 millimetres or more over three consecutive days. Note: For the purposes of this condition, the rainfall shall be that measured at the Akaroa EWS weather station operated by NIWA (Agent number = 36593).
Non-compliant (Attachments 1.1 and 2.1, 2.2); >750m³ recorded on the 23/07/14 following total of 45 millimetres rainfall depth over the three consecutive days.	
6	Treated wastewater shall be sampled after treatment and prior to discharge into Akaroa Harbour via the outfall. The samples shall be grab samples collected at the frequencies specified, and analysed for the contaminants listed in Table 1: Treated wastewater quality monitoring – contaminants and sampling frequency Weekly (1 Dec-28 Feb) Faecal coliforms, enterococci, total suspended solids (TSS), total five day biochemical, oxygen demand (BOD5), dissolved reactive phosphorous (DRP), ammonia, Nitrogen oxides (NOx), total phosphorus (TP), Total nitrogen (TN), temperature Monthly (between 1 Mar and 30 Nov) Faecal coliforms, enterococci, total suspended solids (TSS), BOD5, DRP, ammonia, NOx, TP, TN, temperature Annually (during Jan) lead, copper, chromium, cadmium, zinc
Compliance (Attachment 3.1)	
7	Sampling shall be undertaken in accordance with the sampling schedule in Conditions (6), (12) and (16). The schedule shall seek to incorporate sampling during times with variable environmental parameters listed in Condition (20) (b) to (d) This schedule is to be agreed with the Canterbury Regional Council's RMA Compliance and Enforcement Manager within one month of the commencement of this consent.
Compliance	

8	The median concentration of faecal coliforms in the treated wastewater shall not exceed 1,000 per 100 millilitres
	Non-compliant (Attachment 3.1); one exceedance in December 2014 (1875 FC), and three exceedances in January 2015 (1875, 1875, 1845).
9	The consent holder shall use the best practicable option to ensure the median concentration of BOD5 and TSS does not exceed 30 grams per cubic metre
	Compliance (Attachment 3.1); maximum medians were 6.9 mg/L BOD₅ and 14.0 mg/L TSS
10	For the purposes of conditions (8) and (9) the median shall be calculated from the results of any five consecutive treated wastewater samples analysed
	Compliance (Attachment 3.1)
11	The receiving water shall be sampled and analysed for faecal coliforms and enterococci at the following locations, as shown on Plan CRC133179B, which forms part of this consent: a. At the shoreline nearest the outfall; b. 400 metres along the shoreline in a southerly direction from Site (a); and c. 400 metres along the shoreline in a northerly direction from Site (a).
	Compliance (Attachment 3.2)
12	Receiving water sampling and analysis for faecal coliforms and enterococci concentrations shall occur at least weekly between 1 December and 28 February each year and at least monthly for faecal coliforms between 1 March and 3 November each year. Receiving water sampling shall occur within six hours of treated wastewater sampling.
	Compliance (Attachment 3.2)
13	In the event that the analysis of receiving water samples collected at each site beyond the 250 metre mixing zone in accordance with Conditions (11) and (12) indicates: a. A concentration of faecal coliforms that exceeds a rolling median of 14 faecal coliforms per 100 millilitres from the previous five samples collected in the period 1 December to 28 February each year, the consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of detecting the exceedance; b. That the concentration of the faecal coliforms in more than ten percent of total samples collected between 1 December and 28 February each year exceeds 43 faecal coliforms per 100 millilitres, the consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of detecting the exceedance.
	Compliance; ECAN was notified of three exceedances of the trigger levels. 7.7% of all summer samples > 43 cfu/100ml
14	The notification required under Condition (13) shall include the information required to be collected in Condition (20) and shall identify whether the exceedance is likely to have resulted from wastewater discharged from the Akaroa Wastewater Treatment Plant and if so, shall detail what measures the consent holder has implemented or will implement to mitigate any adverse environmental effects as a result of the exceedance, and to prevent a reoccurrence.
	Compliance ECAN was notified
15	Grab samples of the receiving water shall be collected and analysed for temperature, Total Nitrogen (TN), Dissolved Inorganic Nitrogen (DIN, calculated as NO _x + ammonia), Total Phosphorus (TP), chlorophyll-a and Dissolved Reactive Phosphorus (DRP) at the following locations as shown on Plan Consent detail CRC133179C, which forms part of this consent: a. 250 metres due north of the outfall; b. 250 metres due west of the outfall; c. 250 metres due south of the outfall; d. A control site located at or about map reference (NZMG) NZMS 260: N36:0592-1117; (NZTM) Topo 50: BY25:959-4958, located in French Bay; and e. A control site located at or about map reference (NZMG) NZMS 260: N36:0472-1056; (NZTM) Topo 50: BY25:9471-4897, [potential site of long term outfall].
	Compliance (Attachment 3.3)
16	The receiving water sampling and analysis carried out in accordance with Condition (15) shall occur once every three weeks between 1 December and 28 February each year such that a total of four samples are taken over the summer period. Receiving water sampling shall occur within six hours of treated wastewater sampling.
	Compliance (Attachment 3.3)
17	For individual sampling events (as detailed in Condition (16)), if the analysis of receiving water samples

	<p>collected in accordance with Conditions (15) (a) to (c) indicates trigger values of:</p> <p>a. Dissolved inorganic nitrogen (DIN) (combined total of NO_x and ammonia) that exceeds a median of 0.062 milligrams per litre (mg/L);</p> <p>b. Dissolved reactive phosphorus (DRP) that exceeds a median of 0.018 mg/L; and</p> <p>c. Ammonia that exceeds a maximum of 0.910 mg/L;</p> <p>the consent holder shall identify whether the Akaroa Wastewater Treatment Plant is operating abnormally and if so, shall record what measures the consent holder has implemented or will implement to return the Akaroa Wastewater Treatment Plant to normal operation, and to prevent a reoccurrence.</p>
	Compliance (Attachment 3.3)
18	<p>Within one month of the end of the monitoring period required by Condition (16), the consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager if the trigger values specified in Condition (17) were exceeded.</p> <p>This notification shall include the information required to be collected in Condition (20) and shall identify whether the Consent detail exceedence is likely to have resulted from wastewater discharged from the Akaroa Wastewater Treatment Plant and if so, shall detail what measures the consent holder has implemented or will implement to mitigate any adverse environmental effects as a result of the exceedence, and to prevent a reoccurrence.</p>
	Compliance
19	<p>All wastewater and receiving environment samples shall:</p> <p>a. be collected by a suitably qualified or experienced person; and</p> <p>b. be analysed at a laboratory accredited for the analyses to ISO guide 25, either by International Accreditation New Zealand (IANZ), or by an organisation with a mutual agreement with IANZ.</p>
	Compliance
20	<p>At the time the wastewater and receiving environment samples are collected, the following parameters shall be recorded;</p> <p>a. time and date of sampling and time delay between wastewater and receiving environment samples collection;</p> <p>b. the precipitation over the three consecutive days prior to sampling;</p> <p>c. the tidal state in the receiving environment at the time of sampling in the receiving environment; and</p> <p>d. wind direction and strength.</p>
	Compliance (Attachment 3.3)
21	<p>The consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, any sampling results required by this consent during each month by the 10th working day of the following month.</p>
	Compliance via this report
22	<p>The consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, an annual report prepared by a suitably qualified person by 31 August each year which includes, but is not limited to the following:</p> <p>a. Results of the monitoring undertaken in the previous year from 1 July to 30 June;</p> <p>b. An analysis of monitoring results against limits and trigger values specified in Conditions (8), (9), (13) and (17) of this consent;</p> <p>c. A comparison of monitoring results for control sites and sites on the edge of the mixing zone for parameters as specified in Conditions (15) to (17).</p> <p>d. An analysis of the extent of correlation between the receiving water monitoring results and treated wastewater monitoring results, as required in Conditions (6), (11), (12), (15) and (16). This shall include an assessment of the information collected for Condition (20), its impact on the results and any changes to the sampling regime as a result of this analysis that have been agreed with Canterbury Regional Council;</p> <p>e. Comparison of monitoring results as required in Conditions (6), (11), (12), (15) and (16) with historical data;</p> <p>f. Comparison of the monitoring results required in Conditions (6), (11), (12), (15) and (16). with operation and performance issues from the WWTP; Consent detail</p> <p>g. An interpretation of the results in relation to the effects of the discharge on the environment;</p> <p>h. Identification of any measures taken to remedy any exceedences;</p> <p>i. Details of all changes or upgrades to the treatment plant that may affect the quality or volume of treated wastewater discharged; and</p> <p>j. Summary of any inflow and/or infiltration investigations or works undertaken in the reporting period.</p>
	See below
23	<p>Copies of all monitoring results and reports relating to the discharge from the Akaroa Wastewater Treatment Plant shall be made available to the community via the Akaroa Service Centre and the Christchurch City Council website.</p>
	CCC to follow up

24	The consent holder shall submit to the Canterbury Regional Council, within six months of the grant of this consent, a management plan that details; a. measures that will be taken to ensure compliance with the consent limits specified in this consent relating to treated wastewater, as specified in Condition (8) and (9) and receiving environment microbiological parameters specified in Condition (13); and; b. Contingency measures in response to mechanical or electrical failures.
	Compliance
25	The consent shall be exercise in accordance with the management plan.
	Compliance
26	The consent holder shall achieve the following milestones within the term of this consent: a. Lodge all applications for the approvals under the Resource Management Act 1991 required to commission the new Akaroa Wastewater Treatment Plant no later than 30 June 2014; b. Award contracts for the construction of the new Wastewater Treatment Plant within eight calendar months of the commencement of the resource consents sought under clause (a) of this condition; c. Require contractors to commence construction on the site of the new Wastewater Treatment Plant within nine months of awarding the contracts under clause (b) of this condition; d. To have a fully operational new Wastewater Treatment Plant within 36 months of awarding the contracts under clause (b) of this condition.
	CCC to follow up
27	The discharge from Akaroa WWTP at or about map reference (NZMG) NZMS 260: N37: 0558-0991; (NZTM) Topo 50: BY25:9558-4831, shall cease no more than five years following the commencement of Coastal Permit CRC133179. The consent holder shall submit an annual progress report to the Canterbury Regional Council by the 31 August each year detailing progress made towards meeting the deadline for cessation of the discharge and the clauses of Condition (26).
	CCC to follow up
28	The Canterbury Regional Council may, on any of the last five working days of May or November each year, serve notice of its intention to review the conditions of this consent for the purposes of: a. dealing with any adverse effects on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; b. requiring the adoption of the best practicable option to remove or reduce any adverse effects on the environment; requiring the consent holder to conduct monitoring instead of, or in addition to, that required by the consent; and c. complying with the requirements of a relevant rule in an operative regional plan.
	ECAN to request

Treatment Plant Effluent Monitoring

Flows into the Akaroa Wastewater Treatment Plant (WWTP) were heavily impacted by heavy rain and stormwater on the 23/07/14 causing discharge in excess of the 750-m³/d dry weather maximum. For this event, 45 mm of rainfall was received over three consecutive days (Attachment 2.1). No exceedance of the 3,000-m³/d wet weather maximum applied and flows were compliant. Lower flows were recorded through the plant than the previous reporting period (i.e., 103,064 m³ in 2013-2014 vs. 79,046 m³ in 2014-2015) the 95th percentile for flow recorded at 400 m³/d (down from 470m³/d in 2013/2014) (Attachment 1).

Plant performance relating to organic parameters BOD₅, TSS, was very good with no exceedances above the 30-mg/L median limits for effluent quality (Table 1).

Four faecal coliform (FC) exceedances were recorded over the summer period when an increased loading was received at the plant considered to coincide with the high summer seasonal holiday population.

A new consent was granted in 2013 (CRC133179) which we are now working under and reporting on.

Receiving Environment Monitoring

Some trigger limits were exceeded for human-health related parameters (Attachment 3.2). An average of 6.2% of FC samples were >43 CFU/100mL. All location medians were <14 CFU/100mL FC.

Nutrient data gathered from the receiving environment did not exceed trigger values at any locations for NOx (Attachment 3.3). This represents an improvement compared to 2012/2013 when 3 medians were exceeded.

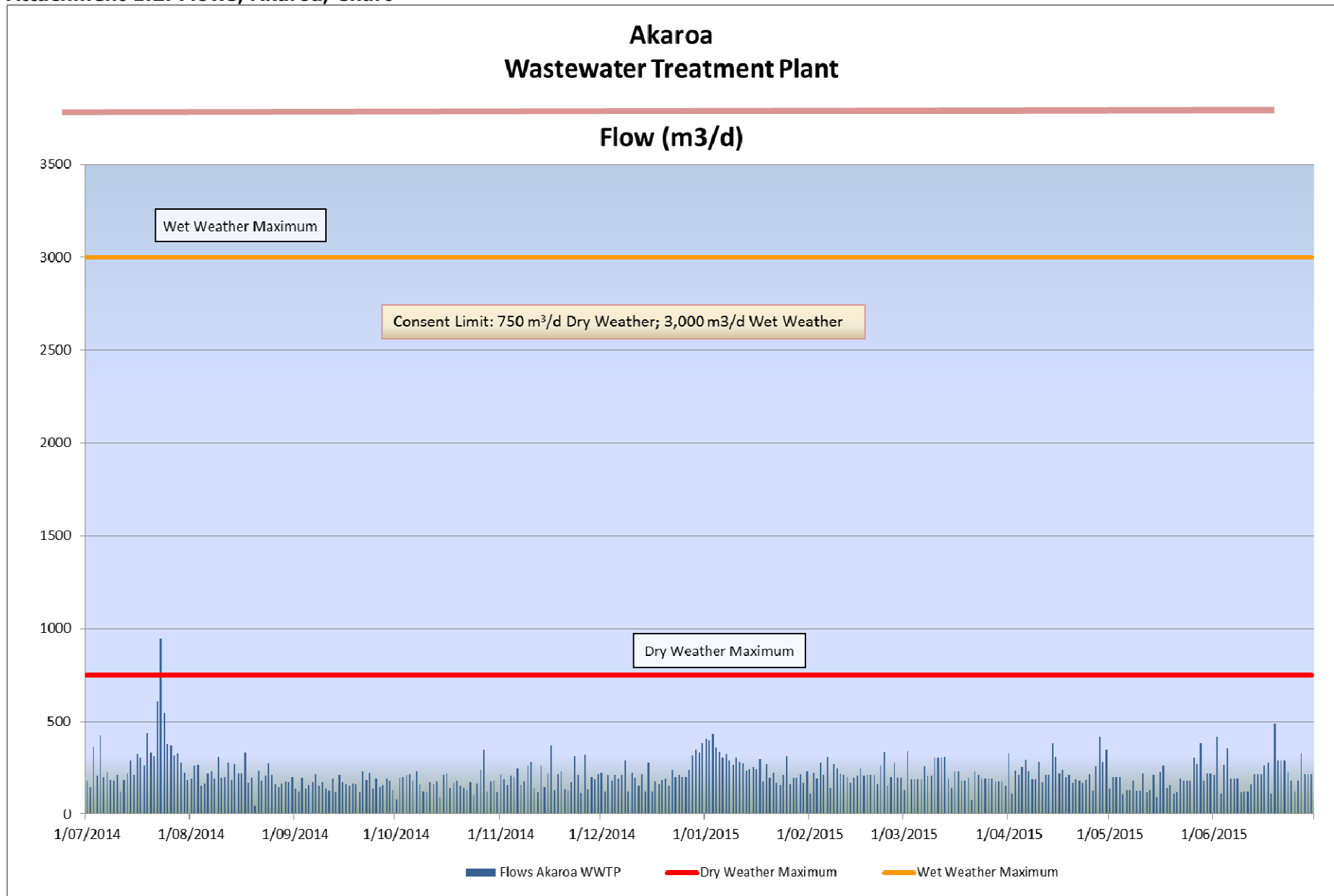
Table 1. Summary of Monitoring Non-Compliances from July 2013-June 2014.

Treatment Plant Effluent			
Parameter	Single Samples Exceeding Limit	Median Limit Exceedances	Condition Non-Compliances
Dry Weather Flow < 750 m3/d	1	-	1
Wet Weather Flow < 3,000 m3/d	0	-	
BOD ₅ < 30 mg/L	0	0	0
TSS < 30 mg/L	0	0	
FC < 1,000 CFU/100 mL	6	4	6
Receiving Environment			
Parameter	Single Samples Exceeding Limit	Median Limit or % Exceedances	Condition Non-Compliances
Summer FC < 14 CFU/100 mL	4	0	4
<10% Summer FC > 43 CFU/100 mL	4	0	
DIN < 0.062 mg/L	0	0	0
DRP median < 0.018 mg/L	0	0	
NH3 median < 0.910 mg/L	0	0	

Attachment 1.1: Flows, Akaroa, Data

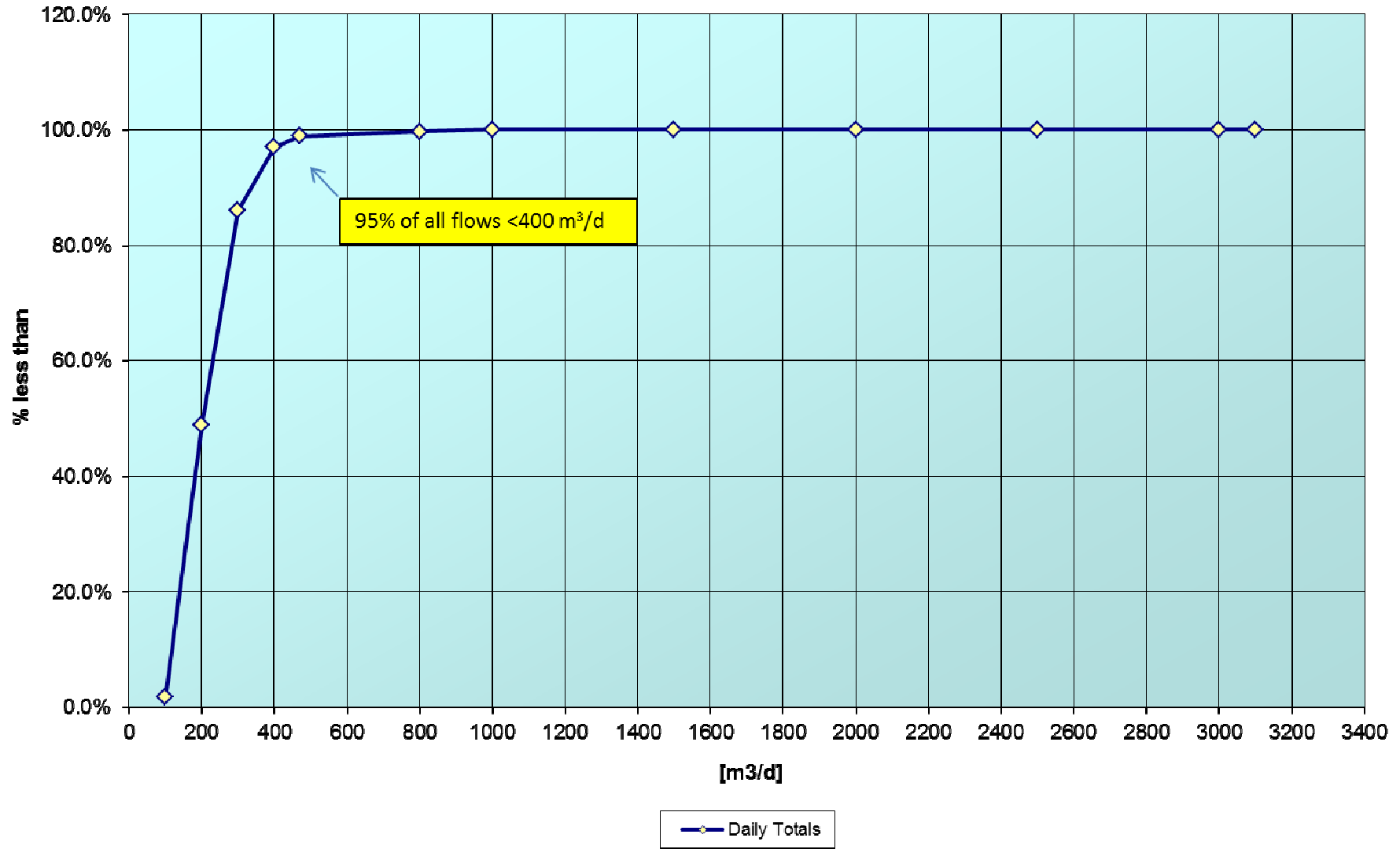
Plant: Akaroa Wastewater Treatment, Banks Peninsula							
Date	Flow [m ³ /d]	Date	Flow [m ³ /d]	Date	Flow [m ³ /d]	Date	Flow [m ³ /d]
1/07/2014	180	1/10/2014	80	1/01/2015	404	1/04/2015	328
2/07/2014	150	2/10/2014	198	2/01/2015	402	2/04/2015	108
3/07/2014	361	3/10/2014	202	3/01/2015	436	3/04/2015	238
4/07/2014	203	4/10/2014	214	4/01/2015	356	4/04/2015	214
5/07/2014	426	5/10/2014	218	5/01/2015	336	5/04/2015	254
6/07/2014	201	6/10/2014	182	6/01/2015	307	6/04/2015	292
7/07/2014	228	7/10/2014	233	7/01/2015	326	7/04/2015	233
8/07/2014	185	8/10/2014	159	8/01/2015	291	8/04/2015	187
9/07/2014	180	9/10/2014	125	9/01/2015	263	9/04/2015	187
10/07/2014	212	10/10/2014	114	10/01/2015	305	10/04/2015	283
11/07/2014	124	11/10/2014	172	11/01/2015	280	11/04/2015	174
12/07/2014	184	12/10/2014	162	12/01/2015	273	12/04/2015	207
13/07/2014	220	13/10/2014	178	13/01/2015	238	13/04/2015	207
14/07/2014	289	14/10/2014	93	14/01/2015	243	14/04/2015	383
15/07/2014	209	15/10/2014	212	15/01/2015	254	15/04/2015	310
16/07/2014	326	16/10/2014	219	16/01/2015	246	16/04/2015	221
17/07/2014	307	17/10/2014	146	17/01/2015	296	17/04/2015	240
18/07/2014	262	18/10/2014	170	18/01/2015	177	18/04/2015	202
19/07/2014	440	19/10/2014	181	19/01/2015	270	19/04/2015	210
20/07/2014	332	20/10/2014	152	20/01/2015	197	20/04/2015	167
21/07/2014	313	21/10/2014	145	21/01/2015	224	21/04/2015	190
22/07/2014	608	22/10/2014	134	22/01/2015	169	22/04/2015	180
23/07/2014	946	23/10/2014	173	23/01/2015	158	23/04/2015	169
24/07/2014	548	24/10/2014	98	24/01/2015	213	24/04/2015	186
25/07/2014	377	25/10/2014	166	25/01/2015	315	25/04/2015	218
26/07/2014	370	26/10/2014	239	26/01/2015	161	26/04/2015	128
27/07/2014	317	27/10/2014	351	27/01/2015	198	27/04/2015	255
28/07/2014	328	28/10/2014	123	28/01/2015	198	28/04/2015	416
29/07/2014	275	29/10/2014	178	29/01/2015	216	29/04/2015	283
30/07/2014	226	30/10/2014	179	30/01/2015	168	30/04/2015	348
31/07/2014	184	31/10/2014	119	31/01/2015	232	1/05/2015	140
1/08/2014	191	1/11/2014	215	1/02/2015	107	2/05/2015	199
2/08/2014	262	2/11/2014	190	2/02/2015	223	3/05/2015	199
3/08/2014	264	3/11/2014	158	3/02/2015	193	4/05/2015	199
4/08/2014	151	4/11/2014	206	4/02/2015	275	5/05/2015	105
5/08/2014	163	5/11/2014	200	5/02/2015	213	6/05/2015	134
6/08/2014	221	6/11/2014	250	6/02/2015	308	7/05/2015	133
7/08/2014	233	7/11/2014	156	7/02/2015	143	8/05/2015	179
8/08/2014	193	8/11/2014	176	8/02/2015	270	9/05/2015	129
9/08/2014	308	9/11/2014	262	9/02/2015	249	10/05/2015	129
10/08/2014	195	10/11/2014	282	10/02/2015	221	11/05/2015	220
11/08/2014	200	11/11/2014	143	11/02/2015	209	12/05/2015	117
12/08/2014	279	12/11/2014	118	12/02/2015	201	13/05/2015	132
13/08/2014	184	13/11/2014	261	13/02/2015	168	14/05/2015	210
14/08/2014	269	14/11/2014	147	14/02/2015	197	15/05/2015	91
15/08/2014	221	15/11/2014	221	15/02/2015	204	16/05/2015	229
16/08/2014	221	16/11/2014	370	16/02/2015	250	17/05/2015	260
17/08/2014	333	17/11/2014	134	17/02/2015	205	18/05/2015	146
18/08/2014	170	18/11/2014	216	18/02/2015	212	19/05/2015	155
19/08/2014	198	19/11/2014	234	19/02/2015	208	20/05/2015	107
20/08/2014	47	20/11/2014	137	20/02/2015	214	21/05/2015	115
21/08/2014	237	21/11/2014	129	21/02/2015	162	22/05/2015	193
22/08/2014	180	22/11/2014	172	22/02/2015	260	23/05/2015	182
23/08/2014	206	23/11/2014	313	23/02/2015	339	24/05/2015	182
24/08/2014	271	24/11/2014	207	24/02/2015	154	25/05/2015	182
25/08/2014	209	25/11/2014	110	25/02/2015	200	26/05/2015	306
26/08/2014	159	26/11/2014	323	26/02/2015	276	27/05/2015	267
27/08/2014	150	27/11/2014	136	27/02/2015	196	28/05/2015	381
28/08/2014	166	28/11/2014	200	28/02/2015	196	29/05/2015	179
29/08/2014	177	29/11/2014	189	1/03/2015	131	30/05/2015	219
30/08/2014	171	30/11/2014	215	2/03/2015	342	31/05/2015	219
31/08/2014	201	1/12/2014	226	3/03/2015	190	1/06/2015	210
1/09/2014	139	2/12/2014	123	4/03/2015	190	2/06/2015	419
2/09/2014	126	3/12/2014	208	5/03/2015	190	3/06/2015	106
3/09/2014	196	4/12/2014	180	6/03/2015	190	4/06/2015	265
4/09/2014	140	5/12/2014	210	7/03/2015	256	5/06/2015	354
5/09/2014	155	6/12/2014	194	8/03/2015	204	6/06/2015	194
6/09/2014	174	7/12/2014	209	9/03/2015	205	7/06/2015	193
7/09/2014	216	8/12/2014	288	10/03/2015	307	8/06/2015	193
8/09/2014	151	9/12/2014	126	11/03/2015	307	9/06/2015	122
9/09/2014	172	10/12/2014	226	12/03/2015	307	10/06/2015	123
10/09/2014	140	11/12/2014	198	13/03/2015	307	11/06/2015	123
11/09/2014	127	12/12/2014	153	14/03/2015	192	12/06/2015	162
12/09/2014	194	13/12/2014	218	15/03/2015	143	13/06/2015	216
13/09/2014	115	14/12/2014	123	16/03/2015	234	14/06/2015	216
14/09/2014	208	15/12/2014	276	17/03/2015	234	15/06/2015	216
15/09/2014	171	16/12/2014	126	18/03/2015	179	16/06/2015	260
16/09/2014	160	17/12/2014	177	19/03/2015	179	17/06/2015	279
17/09/2014	153	18/12/2014	161	20/03/2015	195	18/06/2015	109
18/09/2014	164	19/12/2014	183	21/03/2015	77	19/06/2015	488
19/09/2014	159	20/12/2014	194	22/03/2015	234	20/06/2015	290
20/09/2014	122	21/12/2014	153	23/03/2015	212	21/06/2015	290
21/09/2014	234	22/12/2014	241	24/03/2015	193	22/06/2015	290
22/09/2014	184	23/12/2014	202	25/03/2015	192	23/06/2015	229
23/09/2014	224	24/12/2014	209	26/03/2015	192	24/06/2015	179
24/09/2014	140	25/12/2014	200	27/03/2015	192	25/06/2015	123
25/09/2014	194	26/12/2014	202	28/03/2015	176	26/06/2015	181
26/09/2014	148	27/12/2014	242	29/03/2015	176	27/06/2015	331
27/09/2014	155	28/12/2014	316	30/03/2015	175	28/06/2015	215
28/09/2014	192	29/12/2014	351	31/03/2015	154	29/06/2015	215
29/09/2014	182	30/12/2014	333			30/06/2015	215
30/09/2014	133	31/12/2014	382				

Attachment 1.2: Flows, Akaroa, Chart



Attachment 1.3: Flows, Akaroa, '% less than'

Akaroa WWTP flows < x m³/d





Attachment 2.1: Rainfall data, Akaroa

Station information:									
Name	Agent Number	Network	Latitude (dec.deg)	Longitude	Height (m)	Posn_Pri	Observing Authority		
Akaroa Ev	36593	H32895	-43.809	172.97	45	G	Niwa		
Note: Position precision types are: "W" = based on whole minutes, "T" = estimated to tenth minute, G = derived from gridref, "E" = error cases derived from gridref, H = based on GPS readings (NZGD49), "D" = by definition i.e. grid points.									
Rain: Daily									
Station	Date(NZST) : Time	Amount (mm)	3 day total (mm)	SofG	Deficit (mm)	Runoff (mm)	Period (Hrs)	Freq	Comment
36593	20140719:0900	11.8		-	0	11.1	24	D	
36593	20140720:0900	5.8		-	0	5.1	24	D	
36593	20140721:0900	4.4	22	-	0	3.7	24	D	
36593	20140722:0900	21.4	31.6	-	0	20.7	24	D	
36593	20140723:0900	19	44.8	-	0	18.3	24	D	<50mm/3d
36593	20140724:0900	0.6	41	-	0.1	0	24	D	

Attachment 2.2: Rainfall Station 36593, Akaroa

Station Details for Agent: 36593

[Check Data Availability](#) | [Sensor and Site History](#)

Parameter 	Indicator
Agent Number	36593
Network Number	H32895
Name	Akaroa Ews
Lat (dec deg, S of equator is neg)	-43.80938
Longitude (dec deg, E of Greenwich is pos e.g. NZ)	172.96574
Position Precision	G
<i>Note: Position precision types are: "W" = based on whole minutes, "T" = estimated to tenth minute, "G" = derived from gridref, "E" = error cases derived from gridref, "H" = based on GPS readings (NZGD49), "D" = by definition i.e. grid points. </i>	
Height above MSL in metres	45m
Grid Reference (NZ Metric Map Series)	N36073109
Start Date	12-Nov-2008
End Date	-
Closed Indicator (Closed = 1)	0
Stty Station Type	C: Clitel
Synoptic Number (World Met. Organisation Number)	-
WRA No	328905
Observing Authority	Niwa

Current Indicators

Note: the following indicators show the current status for open stations. Closed stations may show no recorded parameters.

Parameter	Indicator	Parameter	Indicator
Rain	X	Evaporation	-
Surface Wind Dirn	X	Surface Wind Speed	X
Max Gust Dirn	-	Max Gust Speed	-
Solar Radiation	-	Sunshine Hours	-
10cm Earth Temp	X	20cm Earth Temp	X
30cm Earth Temp	-	100cm Earth Temp	-
Dry Bulb Temp	X	Wet Bulb Temp	X
Grass Min Temp	X	Weather Phenomenon	-
Max Temp	X	Min Temp	X
Visibility	-	Cloud Amount	-
MSL Pressure	-		
Wind Run	-		
Time Offset (from UTC): 12		dayl_daylight_area	02

Attachment 3.1: Lab Data, Akaroa Wastewater Treatment Plant (Conditions 6-10)

	Date	NH ₄ -N [mg/l]	BOD ₅ [mg/l]	ENT MPN/100ml	FC CFU/100ml	Temp [deg C]	NOx [mg/l]	DRP [mg/l]	TP [mg/l]	TSS [mg/l]	TN [mg/l]	5-Sample Median		
												BOD ₅ [mg/l]	TSS [mg/l]	FC CFU/100ml
												Jul-14	2/07/2014	0.96
Aug-14	5/08/2014	1.0	4.6	10	10	7.5	18	3.2	4.0	10	3.6	4.6	12	10
Sep-14	2/09/2014	5.4	9.1	10	10	11.8	17	3.7	4.7	17.0	1.2	4.4	15	10
Oct-14	1/10/2014	24	11	10	10	13.0	7.0	5.9	6.6	17	1.7	4.6	16	10
Nov-14	10/11/2014	16	9.3	230	500	14.0	8.8	4.5	6.0	19	5.2	4.4	15	10
Dec-14	2/12/2014	7.8	5.2	10	10	17.0	14	4.8	5.0	12	9.3	5.6	13	10
	9/12/2014	12	4.5	20	20	18.0	14	4.7	5.5	10	11	8.0	17	10
	16/12/14	8.4	6.7	40	250	18.6	18.0	4.9	6.6	16.0	5.7	6.7	16	10
	23/12/14	5	3.2	230	3,500	18.0	17.0	5.5	6.8	13.0	7.6	5.0	15	250
Jan-15	30/12/14	23.0	2.5	16000	6,000	21.0	8.6	5.5	8.6	24.0	17	3.2	16	1,875
	6/01/2015	23	7.4	40	190	22.0	5.0	7.1	8.3	15	22	5.0	16	1,875
	13/01/2015	21	14.0	1300	5000	21.0	7.7	3.9	8.9	28	27	6.7	16	1,875
	20/01/2015	17	5.6	10	10	17.0	13	7.2	8.0	15	26	6.2	19	1,845
Feb-15	27/01/2015	8.4	6.2	170	1,400	21.8	21	6.0	7.5	10.0	6.6	6.2	17	795
	3/02/2015	4.9	6.1	1500	4400	22.0	26	5.4	6.9	13.0	9.7	6.2	12	190
	10/02/2015	11	5.8	1000	5600	21.0	23	7.0	7.8	16.0	11	6.1	13	705
	17/02/2015	8.3	6.0	41	140	19.0	21	6.1	7.6	11.0	8.9	6.2	12	140
Mar-15	24/02/2015	5.1	4.6	10	100	21.0	25	6.2	6.7	10.0	19	6.2	11	140
	3/03/2015	3.6	4.0	10	100	21.3	26	5.2	6.1	17.0	22	6.2	13	100
Apr-15	1/04/2015	3.1	6.6	84	40	18.4	19	4.0	5.0	20	4.8	6.1	14	100
May-15	7/05/2015	3.4	5.6	10	10	12.9	25	3.5	4.3	26	2.0	6.2	11	100
Jun-15	10/06/2015	14	8.5	10	1	12.0	6.3	2.0	3.3	42	1.0	6.1	14	55
Limit												30	30	1,000

Attachment 3.2: Lab Data, Receiving Environment (Condition 11-14 and 20)

	400m Shoreline North	400m Shoreline South	Shoreline nearest OF	400m Shoreline North	400m Shoreline South	Shoreline nearest OF	400m Shoreline North	400m Shoreline North	400m Shoreline South	400m Shoreline South	Shoreline nearest Outfall	Shoreline nearest Outfall
	ENT	ENT	ENT	FC	FC	FC	Sample Time	Time between samples taken from STP & RCV	Sample Time	Time between samples taken from STP & RCV	Sample Time	Time between samples taken from STP & RCV
	MPN/100ml	MPN/100ml	MPN/100ml	CFU/100ml	CFU/100ml	CFU/100ml						
2/07/2014				<1	<1	<1						
5/08/2014				<1	1	<1						
2/09/2014				<10	<10	<10						
1/10/2014				2	3	1						
10/11/2014				<2	<2	<2						
02/12/2014	not tested	not tested	not tested	17	9	7	07.20	0:10	07.10	0:15	07.00	0:20
09/12/2014	<10	<10	<10	2	4	2	07.00	0:25	07.10	0:10	07.20	0:20
16/12/2014	<10	<10	<10	<1	<1	<1	08.45	-0:10	08.55	-0:30	08.50	-0:20
23/12/2014	<10	<10	20	3	1	<10	08.35	0:10	08.45	0:05	08.40	0:15
30/12/2014	<10	<10	<10	8	12	21	07.45	-0:26	07.35	-0:20	07.40	-0:18
06/01/2015	<10	10	<10	1	1	<1	07.00	-0:18	07.10	-0:13	07.15	-0:08
13/01/2015	<10	<10	<10	<1	<1	<1	07.25	0:05	07.35	0:15	07.40	0:10
20/01/2015	320	240	250	444	496	520	07.25	-0:08	07.35	-0:17	07.30	-0:11
27/01/2015	10	98	41	36	34	46	08.40	-0:15	08.30	-0:20	08.35	-0:10
03/02/2015	120	10	120	11	4	7	07.25	0:25	07.20	0:15	07.15	0:20
10/02/2015	<10	<10	<10	<2	<2	<2	07.05	0:10	06.55	0:20	07.00	0:15
17/02/2015	<10	<10	<10	<1	1	1	07.52	0:10	07.37	0:30	07.45	0:20
24/02/2015	<10	<10	<10	7	6	5	08.25	-0:40	08.15	-0:10	08.20	-0:20
03/03/2015	10	<10	<10	6	6	7	08.30	-0:41	08.35	-0:11	08.40	-0:21
01/04/2015				1	<1	<1						
07/05/2015				220	230	230						
10/06/2015				<1	<1	<1						
Removed < for calculations and halved the value.												
5 sample median of Summer samples >14				0	0	0						
# summer samples > 43				1	1	2						
% summer samples > 43				7.7%	7.7%	15.4%						
# total samples > 43				2	2	3						
% total samples > 43				9.1%	9.1%	13.6%						
# all summer samples > 43						4						
% all summer samples > 43						6.2						

Attachment 3.3: Lab Data, Receiving Environment (Conditions 15-18)

	250 metres due north							250 metres due west							250 metres due south						
	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L
TRIGGER				0.910	0.062		0.018				0.910	0.062		0.018				0.910	0.062		0.018
2/12/2014	13.0	0.22	0.011	0.003	0.014	0.0090	0.0041	13.0			0.010	0.010	0.011	0.0044	13.0	0.20	0.010	0.005	0.015	0.010	0.0048
16/12/2014	16.5	0.15	0.010	0.003	0.013	0.020	0.0057	16.5	0.11	0.010	0.0050	0.015	0.0050	0.0062	16.5	0.13	0.010	0.0050	0.015	0.018	0.0057
30/12/2014	18.0	0.17	0.010	0.051	0.061	0.016	0.0051	18.0	0.17	0.010	0.019	0.029	0.014	0.0050	18.0	0.17	0.010	0.018	0.028	0.014	0.0051
27/01/2015	17.0	0.15	0.010	0.005	0.015	0.024	0.010	17.0	0.12	0.010	0.005	0.015	0.027	0.0076	17.0	0.14	0.010	0.005	0.015	0.021	0.0079
10/02/2015	15.0	0.13	0.010	0.023	0.033	0.0090	0.0077	15.0	0.14	0.010	0.005	0.015	0.0090	0.013	15.0	0.15	0.020	0.011	0.031	0.014	0.015

	Plant Effluent				
	TN	NOx	NH3	TP	DRP
	mg/L	mg/L	mg/L	mg/L	mg/L
TRIGGER					
2/12/2014	22.4	14	7.8	5.0	4.8
16/12/2014	27.7	18	8.4	6.6	4.9
30/12/2014	34.6	8.6	23	8.6	5.5
27/01/2015	28.8	21	8.4	7.5	6.0
10/02/2015	31.3	26	4.9	6.9	5.4

Removed < for calculations and halved the value.